UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,057	07/01/2003	Donald J. Curry	117290	3524

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EXAMINER
HUNG, YUBIN

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 11/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

<table>
<tr><td rowspan="2">Office Action Summary</td><td>Application No.
10/612,057</td><td>Applicant(s)
CURRY ET AL.</td><td></td></tr>
<tr><td>Examiner
Yubin Hung</td><td>Art Unit
2624</td><td></td></tr>
</table>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *8* is/are allowed.

6)☒ Claim(s) *1-3, 5-7, 9-11 and 13-15* is/are rejected.

7)☒ Claim(s) *4 and 12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>01 July 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>12/10/03, 5/12/04</u>.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____ .

DETAILED ACTION

Specification

1.   The disclosure is objected to because of the following informalities:

- P. 17, last paragraph, line 3: "155" should have been "150"

- P. 18, 3rd paragraph, last two lines: it is not clear how the 16 possible edge locations are indicated

- P. 23, 2nd paragraph, line 1: "PDL MRC Segmentation Module 25" should have been "PDL Segmentation Module 26"

- P. 23, 4th paragraph through P. 25, 2nd paragraph: it is not clear what the values of Grr (as output from PDL Segmentation Module) are: are they the classes (10 different values), the associated values (i.e., Bgr, Fgr or weak Fgr) as per Fig. 14; or other un-disclosed values?

- Claims 3-15: for consistency consider replacing all instances of "select signal" to "selector signal"

- Claim 3, line 2: for clarity consider replacing "then multi-bit" with "then its corresponding multi-bit"; otherwise it is not clear what the relationship between the pixel and the multi-bit selector signal is. Do the same for claims 5, 11, 13 and (d) and (f) of claim 8

- Claim 4, lines 4 and 5: for clarity consider replacing "contains white then multi-bit select signal" with "contains white then the multi-bit selector signal

corresponding to its center pixel" (per Fig. 11). Do the same for claims 6, 12, 14

and (e) and (g) of claim 8

- Claim 7, lines 3 and 4: for clarity consider replacing "then multi-bit...else strong

  background" with "then if its center pixel belongs to a darker class then the multi-

  bit selector signal corresponding to the center pixel equals strong foreground

  else strong background" (per claim 8 (h) and (i)). Do the same for claim 15

- Claim 8, (h), line 2: for clarity consider replacing "then the multi-bit select signal"

  with "then the multi-bit selector signal corresponding to the center pixel". Do the

  same for (i)

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

3.   Claims 6, 7, 14 and 15 are rejected under 35 U.S.C. 112, second paragraph, as

being indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention.

4.   Claim 6 recites the limitation "the 3x3"" in line 2. There is insufficient antecedent

basis for this limitation in the claim. Claim 14 is similarly rejected.

5.   Claim 7 recites the limitation "the 3x3"" in line 2 and "the center class" in line 3.

There is insufficient antecedent basis for this limitation in the claim. Claim 15 is similarly

rejected.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

7.   Claims 1, 3, 5, 9, 11 and 13 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Crain (US 5220614), and further in view of Queiroz ("Compression of

Compound Documents," IEEE, 1999 Int'l Conf. on Image Processing, Vol. 1, pp. 209-

213; see IDS).

8.   Regarding claim 1, and similarly claim 9, Crain discloses a method for

segmenting foreground and background comprising

- creating a multi-bit selector signal that encodes the direction and
  strength of edges
  [Col. 29, lines 45-47. Note that the magnitude and the direction each
  has at least one bit and together constitute a multi-bit signal]
- filtering the multi-bit selector signal and binarizing the filtered
  multi-bit selector to produce a binary signal
  [Col. 29, lines 48-50. Note that thinning is a kind of filtering.
  Note further that the thinning process sets each pixel to either edge
  or non-edge (i.e., binarization) and the result of combining and
  grouping edge pixels to form closed regions of either foreground and
  background (Col. 29, lines 26-28 and 36-40) is a binary mask]

Crain does not expressly disclose that the binary signal is used for mixed raster content (MRC) selection.

However, Queiroz discloses using a binary mask (i.e., signal) for mixed raster content selection [P. 210, Sect. 3, lines 6-8].

Crain and Queiroz are combinable because they both have aspects that are from the same field of endeavor of segmentation.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Crain with the teaching of Queiroz as recited above. The motivation would have been because MRC is a multi-layer, multi-resolution representation of a compound document (to allow for, for example, more efficient compression by applying the most suitable compression method to each layer of the representation) that uses a mask to describes how to reconstruct the final image from the foreground and background layers [Queiroz: Abstract and P. 210, Sect. 3, lines 6-8] and therefore can benefit from the use of the mask-generating method, which is based on edge detection and is more reliable than thresholding, as disclosed by Crain.

Therefore it would have been obvious to combine Queiroz with Crain to obtain the invention as specified in claim 1.

9.   Regarding claims 3, 5, 11 and 13, official notice is taken that since in a gray-scale representation of pixels values, the value 0 and 255 (assuming 8 bits are used) typically represent white and black, respectively and that white and black are frequently considered as background and foreground colors, respectively (e.g., black text on white paper). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to designate the selector signal as strong background when the pixel is white (claims 3 and 11) or as strong foreground when the pixel is black (claims 5 and 13) and the motivation would have been for it is a common practice (as discussed above) as well as for the simplicity of the approach.

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10.   Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crain (US 5220614) and Queiroz ("Compression of Compound Documents," IEEE, 1999 Int'l Conf. on Image Processing, Vol. 1, pp. 209-213; see IDS) as applied to claims 1, 3, 5, 9, 11 and 13 above, and further in view of Lermant et al. (US 6856428).

11.   Regarding claim 2, and similarly claim 10, the combined invention of Crain and Queiroz discloses all limitations of its parent, claim 1.

The combined invention of Crain and Queiroz does not expressly disclose the following, which Lermant does

- wherein creating a multi-bit selector signal further comprises the step
  of determining if a pixel is pre-segmented as an "image" pixel
  [Fig. 2 (Processing of PDL objects, including "image" object); Col. 2,
  line 58-67. Note that the PDL determines which pixel is an "image"
  pixel, such information is the result of a pre-segmentation (of portions
  of a document into different types, or tags, such as text or image))].

The combined invention of Crain and Queiroz is combinable with Lermant because they

both have aspects that are from the same field of endeavor of document description

(MRC in Queiroz and PDL in Lermant).

At the time of the invention, it would have been obvious to one of ordinary skill in the art

to modify the combined invention of Crain and Queiroz with the teaching of Lermant by

determining whether a re-segmentation has been performed. The motivation would

have been to save processing time (required to determine whether a pixel belongs to

the foreground or the background) by using the readily available information (i.e., the

pixel being an "image" pixel) to classify the pixel as, for example, belonging to the

background, as would have been obvious to one of ordinary skill at the time of the

invention.

Therefore it would have been obvious to combine Lermant with Crain and Queiroz to

obtain the invention as specified in claim 2.

Allowable Subject Matter

12.   Claims 4 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13.   Claims 6, 7, 14 and 15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

14.   Claim 8 is allowed.

15.   The following is a statement of reasons for the indication of allowable subject matter:

15.1   Regarding claims 4, and similarly claims 6, 12 and 14, closest art of record Crain and Queiroz disclose all limitations of its parent, claim 1. In addition, Li et al. (US 6,909,806) discloses whether a pixel should be changed to a background pixel based on the classification probability, among other things, of pixels in its neighborhood (e.g., 5x5) and Cork et al. (US 7,110,585) uses a neighborhood (e.g., 7x7) surrounding to determine whether the pixel belongs to the background or foreground.

However, none of the recited references, alone or in combination, disclose, suggest or teach setting the pixel as strong foreground as long as at least one pixel in a 3x3 neighborhood centered at the pixel is white, regardless whether the pixel in question is black, white or otherwise. [Note that per claims 3 and 5 white is considered as the background and black as the foreground.]

15.2   Regarding claim 7, and similarly claims 8 and 15, in addition to Crain and Queiroz, closest art of record Li et al. (US 6909806) further discloses using a 5x5 window centered at the pixel in question that contains either foreground or background pixels (i.e., exactly two classes) with the pixel in question belonging in either class and further revise the classification of the pixel in question using information from pixels in the window. [See Fig. 4, refs. 102, 104, 122-128 and Col. 6, line 32-Col. 7, line 15.]
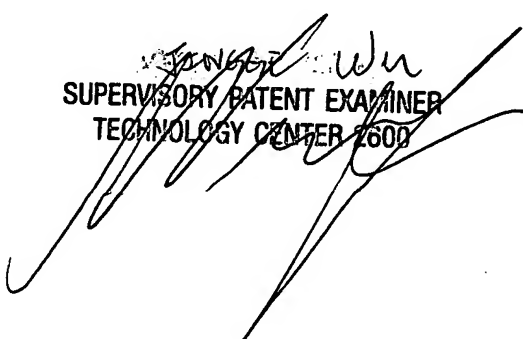
However, none of the recited references, alone or in combination, disclose, suggest or teach designating the pixel in question a foreground pixel if it belongs to the darker class and a background pixel otherwise.

Contact Information

16.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (571) 272-7451. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SUPERVISORY PATENT EXAMINER
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Patent Examiner
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